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*b*, while the values of the Durch-Musterung were taken for the two other stars.

The estimated magnitudes of Nova Aurigæ therefore are:—

| Date. 1892. | | Greenwich Mean Time. h m | Magnitude of Nova Aurigæ. |
|---|---|---|---|
| Feb. | 1 | 6 25 | 6·0 |
| | 3 | 11 10 | 4·6 |
| | 4 | 6 40 | 4·8 |
| | 5 | 7 20 | 4·4 |
| | 6 | 7 10 | 4·1 |
| | 8 | 8 0 | 4·0 (?) |
| | 9 | 10 32 | 4·55 |
| | 10 | 7 40 | 4·8 |
| | 22 | 10 48 | 6·3 |
| Mar. | 23 | 11 0 | Invisible with the Opera-Glass. |
| | 24 | 10 30 | ,, ,, ,, |

## *Comparison of Magnitudes of Nova Aurigæ and neighbouring stars, made with the Newall Telescope, Observatory, Cambridge.* By H. F. Newall, M.A.

Observations on the brightness of the Nova have been made on many occasions since the discovery of the star was announced. Those of more recent date may be of interest, since all the comparison stars are mapped by Burnham (*Monthly Notices*, April, p. 433).

| 1892. | | Nova. | Burnham's Comparison Stars. | |
|---|---|---|---|---|
| Mar. | 24 | Fainter than | F | 10·4 |
| | 29 | Brighter than | G | 11·5 |
| | 31 | Equal to | G | 11·5 |
| | | Brighter than | H | 11·8 |
| | | Fainter than | E | 11·7 |
| Apr. | 1 | Fainter than | E | 11·7 |
| | 6 | Fainter than | I | 11·8 |
| | 8 | Fainter than | J | 12·7 |
| | 11 | N. glimpsed whilst B 14·8 was not seen. | | |
| | 13 | N. suspected once in many attempts to see it. | | |
| | 19 | N. not seen or glimpsed, though B 14·8 and M were seen. | | |
| | 27 | N. not seen; ground dark and comparison stars well seen. | | |

The companion to E was well seen, but C and D have not been seen. K I cannot speak of. All the other stars were

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included in comparisons, but the companion to L was not even suspected.

I should have estimated magnitudes in all cases higher than Burnham's numbers, but my experience is not yet sufficient to warrant my committing myself to numerical estimates, and unfortunately our wedge photometer has only just been received, so that no measures have been made, though observations of faint stars chosen by the American Committee for stellar magnitude standards lead me to the view I have expressed about estimating magnitudes.

*Observatory, Cambridge:*
1892 *May* 13.

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## *On a Diagram useful as a Guide in adjusting a Diffraction-Grating Spectroscope.* By H. F. Newall, M.A.

The diagram which this note describes is intended to give at a glance the interpretation of the well-known relation

$$m \lambda = d (\sin \phi + \sin i)$$

which connects the angles of incidence $i$ and of emergence $\phi$ of a beam of light of wavelength $\lambda$ in a spectrum of order $m$ produced by a plane diffraction grating, on which lines are ruled with an interval $d$ between them.

The diagram has been constructed for a grating ruled with 14438 lines to the inch, which gives $d = 17592 \times 10^{-7}$ mm.

Two rectangular axes are taken; the length of incidence is represented by the length of a line measured off along the horizontal axis, which shall be called the axis of incidence; the angle of emergence of any diffracted beam is represented by a line measured off along the vertical axis, or axis of diffraction.

To explain the construction of the diagram, I describe the plotting of one curve. The following table shows the angle of emergence for the C line in the spectrum of the third order for varying angles of incidence. In above equation, $m=3$, $\lambda = 656{\cdot}18 \times 10^{-6}$ mm.

| Incidence. | Emergence. | Incidence. | Emergence. |
|---|---|---|---|
| ° | ° ′ | ° | ° ′ |
| 0 | — | 50 | 20 39 |
| 10 | 70 55 | 60 | 14 38 |
| 20 | 50 57 | 70 | 10 19 |
| 30 | 38 13 | 80 | 7 42 |
| 40 | 28 25 | 90 | 6 49 |

These values are plotted on the diagram, and the points so obtained are joined by a continuous curve.

Proceeding similarly for other orders of spectra, we cover

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